

What is claimed is:

1. An edge-detecting device for detecting an edge of a medium, the device comprising:

5 a detecting unit that defines a target detection area, and that detects medium detection data at the target detection area, the medium detection data having a different value depending on whether or not a medium is present in the target detection area;

10 an adjusting unit that performs an adjusting operation by controlling the detecting unit to detect values of the medium detection data at a plurality of locations on the medium, thereby adjusting a determining condition based on the plurality of detected values; and

15 an edge detecting unit that performs an edge detecting operation by controlling the detecting unit to detect a value of the medium detection data while moving the position of the target detection area in relation to the medium and by determining whether or not the medium is present in the target detection area based on the value detected by the detecting unit and by using the adjusted determining condition, thereby detecting an edge position of the medium.

20 2. An edge-detecting device according to Claim 1,
25 wherein the detecting unit includes a reflection-type sensor having a light-emitting element and a light-receiving element, the light-receiving element receiving light

reflected from the target detection area when the light-emitting element emits light, the light-receiving element outputting data indicative of an amount of light received by the light-receiving element as the medium detection data;

5 the edge detecting unit determines whether the medium is present in the target detection area based on whether the amount of light received by the light-receiving element exceeds a threshold value;

10 the adjusting unit controls the light-emitting element to emit light with a predetermined amount at the plurality of locations, the adjusting unit adjusting, as the determining condition, the amount of the threshold value based on the amounts of light received by the light-receiving element at the plurality of locations on the medium.

15 3. An edge-detecting device according to Claim 2, wherein the adjusting unit adjusts the threshold value to a value that corresponds to the maximum value among the amounts of light received by the light-receiving element at the plurality of locations on the medium.

20 4. An edge-detecting device according to Claim 2, wherein the adjusting unit adjusts the amount of the threshold value to a value that corresponds to an average of the amounts of light received by the light-receiving element at the plurality of locations on the medium.

5. An edge-detecting device according to Claim 1,
wherein the detecting unit includes a reflection-type
sensor having a light-emitting element and a light-receiving
element, the light-receiving element receiving light
5 reflected from the target detection area when the light-
emitting element emits light, the light-receiving element
outputting data indicative of an amount of light received by
the light-receiving element as the medium detection data;
the edge detecting unit determines whether the medium
10 is present in the target detection area based on whether the
amount of light received by the light-receiving element
exceeds a threshold value;
wherein the adjusting unit adjusts the amount of light
15 emitted by the light-emitting element at the plurality of
locations to such a value that causes the light-receiving
element to receive light with an amount of a predetermined
value;
the adjusting unit adjusts, as the determining
20 condition, the amount of light emitted by the light-emitting
element during the edge detecting operation based on the
amounts of light that have been emitted by the light-
emitting element at the plurality of locations on the medium.

6. An edge-detecting device according to Claim 5,
wherein the adjusting unit sets the amount of light emitted
25 by the light-emitting element during the edge detecting

operation to the small st value from among the amounts of light that have been emitted by the light-emitting element at the plurality of locations on the medium.

7. An edge-detecting device according to Claim 5,
5 wherein the adjusting unit sets the amount of light emitted by the light-emitting element during the edge detecting operation to an average value among the amounts of light that have been emitted by the light-emitting element at the plurality of locations on the medium.

10 8. An edge-detecting device according to Claim 5,
wherein the adjusting unit adjusts the amount of light emitted by the light-emitting element by varying an amount of an electric current supplied to the light-emitting element.

15 9. An edge-detecting device according to Claim 5,
wherein the adjusting unit adjusts the amount of light emitted by the light-emitting element by varying a duty ratio of a pulse electric current supplied to the light-emitting element.

20 10. An image-forming device for forming images on a recording medium, the device comprising:

a conveying unit that conveys the recording medium in a recording-medium conveying direction;

25 a recording unit that moves substantially orthogonal to the recording-medium conveying direction and that

performs a recording operation to form images on the recording medium; and

an edge-detecting device that detects an edge of a medium, the edge-detecting device including:

5 a detecting unit that defines a target detection area and that detects medium detection data at the target detection area, the medium detection data having a different value depending on whether or not a medium is present in the target detection area;

10 an adjusting unit that performs an adjusting operation by controlling the detecting unit to detect values of the medium detection data at a plurality of locations on the medium, thereby adjusting a determining condition based on the plurality of detected values; and

15 an edge detecting unit that performs an edge detecting operation by controlling the detecting unit to detect a value of the medium detection data while moving the position of the target detection area in relation to the medium and by determining whether or not the medium is present in the target detection area based on the value detected by the detecting unit and by using the adjusted determining condition, thereby detecting an edge position of the medium,

25 the edge detecting unit detecting both side edge positions of the recording medium that is conveyed by the

conveying unit, the recording unit performing the recording operation between both side edge positions of the recording medium detected by the edge detecting unit.

11. An image-forming device according to Claim 10,
5 further comprising a moving device that moves the detecting unit and the recording unit in an integral state;

wherein the adjusting unit controls the detecting unit to detect the value of the medium detection data at the plurality of locations on the recording medium as the 10 recording unit moves.

12. An image-forming device according to Claim 10,
wherein the adjusting unit controls the detecting unit to detect a value of the medium detection data at the plurality of locations on the recording medium as the conveying unit 15 conveys the recording medium.

13. An image-forming device according to Claim 10,
wherein the edge-detecting device further comprises an adjustment-start control unit controlling the detecting unit to detect the medium detection data when a leading edge of 20 the recording medium initially passes through the target detection area as the conveying unit conveys the recording medium, thereby determining whether the recording medium has been conveyed to the target detection area based on values of the medium detection data detected by the detecting unit,

25 wherein the adjustment-start control unit controls the

adjusting unit to start executing the adjusting operation after the adjustment-start control unit determines that the recording medium has been conveyed to the target detection area.

5 14. An image-forming device according to Claim 13, further comprising:

10 a recording medium detecting unit that is provided at a recording-medium detecting position upstream from the position at which the detecting unit is capable of detecting the medium detection data and that detects whether the recording medium has been conveyed to the recording-medium detecting position by the conveying unit;

15 wherein the adjustment-start control unit determines whether the recording medium has been conveyed into the target detection area after the recording medium detecting unit detects that the recording medium has been conveyed to the recording-medium detecting position.

20 15. An image-forming device according to Claim 10, wherein the adjusting unit controls the detecting unit to detect the value of the medium detection data at the plurality of locations on the recording medium that are separated from one another at equal intervals.

25 16. An image-forming device according to Claim 10, wherein the adjusting unit controls the detecting unit to detect the value of the medium detection data at the

plurality of locations on the recording medium that are symmetrical with one another in relation to a centerline through the recording medium that is defined along the recording-medium conveying direction.

5 17. An image-forming device according to Claim 10, wherein the conveying unit conveys the recording medium so that the recording medium passes over a reference line extending in the recording-medium conveying direction, regardless of the size of the recording medium; and

10 the adjusting unit controls the detecting unit to detect the value of the medium detection data at the plurality of locations on the recording medium, with at least one location being positioned on the reference line.

15 18. An image-forming device according to Claim 17, wherein the adjusting unit controls the detecting unit to detect the value of the medium detection data first at a location on the recording medium positioned on the reference line.